2.3 Heat Affects the Volume of Solids, Liquids and Gases

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. You and your family give your grandmother a ring for her birthday.

Unfortunately, it is too small to fit her finger. How can the concepts of heat

and temperature help make the ring her proper size?

2. A table-tennis ball was partly crushed by accident. To restore it to its

original shape, Alondra decided to apply what she had studied in science class.

She put the ball into boiling water for one minute. Why did she think of doing

this? Do your think her method worked? Explain your answer.

3) Use your understanding of thermal energy, heat and thermal expansion to answer each question.

1. Train tracks span great distances. Spaced many metres apart are

small gaps between the rails. What’s the purpose of these gaps? What might

happen if the gaps weren’t there?

1. Workers set up these electrical cables during the summer. You’ll

notice that the cables are not stretched tightly. They sag. What is the advantage

of leaving some slack when installing electrical cables like these? What might

happen if the cables were installed tightly with no slack?

1. Did you notice that sidewalks are made of slabs with gaps between

them What is the advantage of leaving the gaps? What might happen if the slabs

were placed right up against each other?

1. Pop and juice bottles are never filled all the way to the top. What is

the advantage of leaving some space in these bottles? What might happen if the

bottles were filled completely?

1. Bridges are made from materials that contract and expand as the

temperature changes, so they cannot be fastened firmly to the bank of a

river or lake. The photographs below show an expansion joint at the end of a

bridge in the winter and in the summer.



Which season is shown in each picture? Explain how you know.

1. Steel rods are used in concrete buildings to help strengthen the concrete.

Steel and concrete expand the same amount when heated. Describe what

might happen if they didn’t.